



# DOE Bioenergy Technologies Office (BETO) 2023 Project Peer Review

Algae Technology Educational  
Consortium (ATEC)  
WBS 1.3.5.201

April 3, 2023  
Advanced Algal Systems  
Ira "Ike" Levine, Algae Foundation  
Cindy Gerck, NREL



# Overview – Project Goals

1. An experienced algal bioeconomy workforce
2. Increase algal literacy
3. Expand educational opportunities through recruitment and outreach to underserved populations and schools
4. Alter public perceptions through education – Shift from Ick to Awesome
5. 2023 Go/No-Go: ATEC will formally collaborate with eight institutions (including high schools, community colleges, colleges, universities, national laboratories or national non-profit research institutions)



# Overview – Project History

FY2017

Peer Review  
500 students served  
2 ATEC schools  
5 AA teachers  
ACES Seaweeds  
Algae Academy

FY2019

Peer Review  
28,845 students served  
7 ATEC schools  
234 AA teachers  
Biotechnology Curriculum  
ACES Microalgae

FY2021

Peer Review  
104,500 students served  
21 ATEC schools  
865 AA teachers  
MOOC #2  
Heterotrophic algae

FY2023

Peer Review  
190,800 students served  
41 ATEC schools  
1,620 AA teachers  
MOOC #3  
Algae Center of Excellence



Formed 2013

FY2016



FY2018

9,120 students served  
5 ATEC schools  
62 AA teachers  
ATEC graduates  
MOOC #1

FY2020

75,845 students served  
11 ATEC schools  
636 AA teachers  
IGSOPs  
Digital Badge System

FY2022

142,208 students served  
31 ATEC schools  
1,232 AA teachers  
HBCU Partnership  
Intro to Phycology  
AlgaePrize 2022-2023

# Approach – ATEC Advances State of the Art

## Prairie View A&M Algae Center of Excellence for Climate Resilient Food-Energy-Water Systems (PACE-FEWS)



A Critical Collaboration



# Approach – Relevance to BETO Goals



## BETO's Education and Workforce Development Goals

**Improve public accessibility to information about bioenergy production**

Design Specialized Education & Training Programs with multiple access strategies

**Support formal and informal education, including STEM & vocational programs**

Educational Collaborations with national organizations

**Engage future scientists and engineers in developing solutions to technical and nontechnical challenges**

Establish K-12 STEM opportunities, directed research, internships, and training platforms for future algae farmers, biotechnicians and entrepreneurs

# Approach – Innovation

## Algal Biotechnology → beyond the pond

Ongoing and planned activities for ATEC

Heterotrophic Growth – Algae in the Dark!

Genetic Modification of Prokaryotic Algae

Laboratory Intensive III + IGSOPs

(Image Guided Standard Operating Procedures)

Genetic Engineering of Eukaryotic Algae

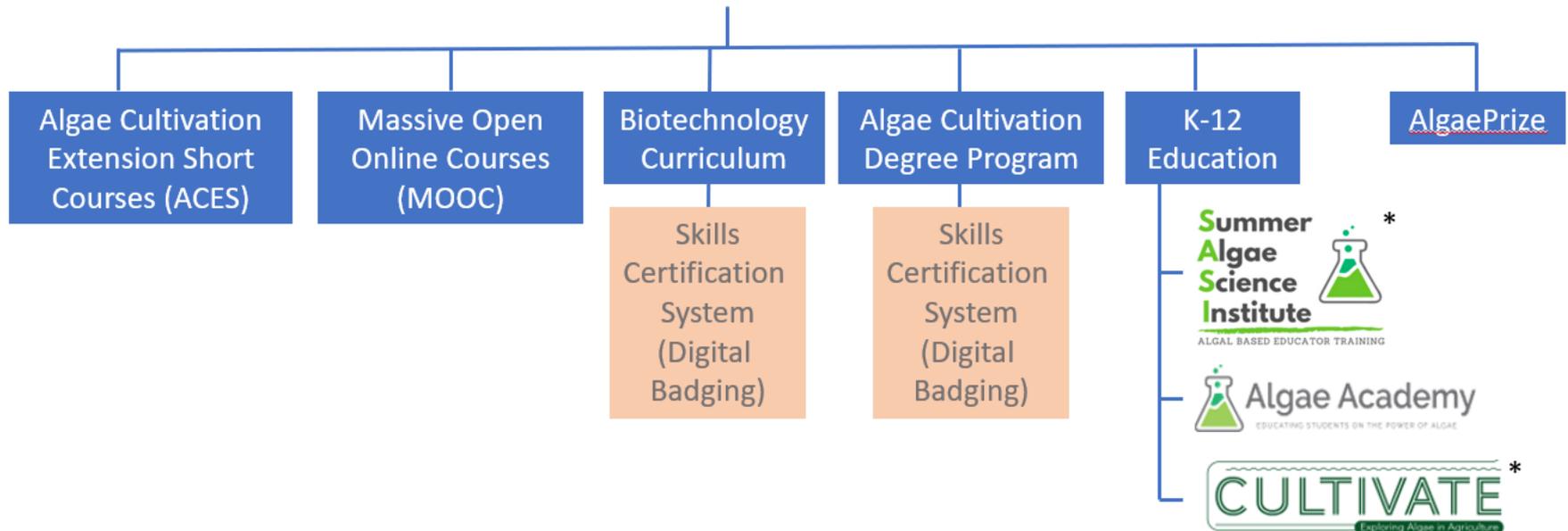
Laboratory Intensive IV + IGSOPs

IGSOPs for Algae Farming

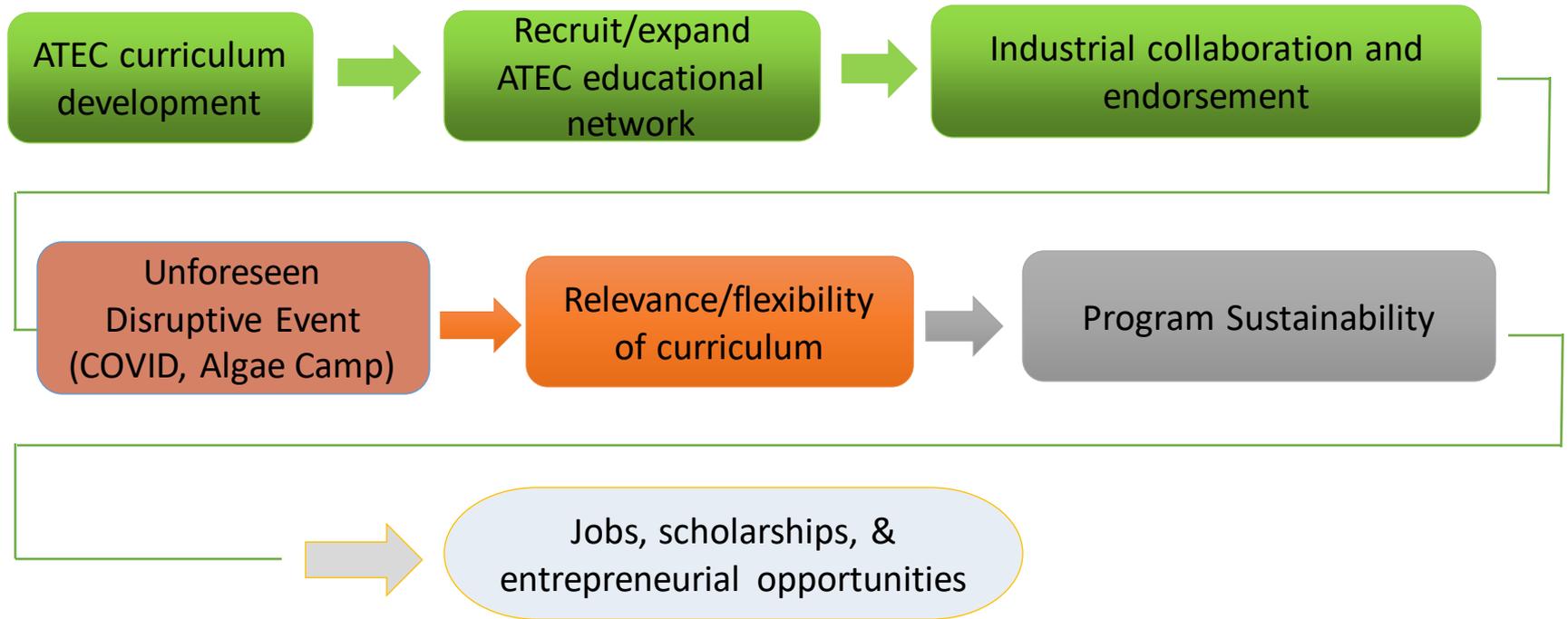


*Algae are a tremendous resource that are largely underutilized in the classroom*

# Approach – Management Plan



# Approach – Risk Mitigation



■ No risks

■ Minor risks

■ Moderate risks

■ Major risks

# Approach – Collaborations



Technical/Project Management



Algae Academy  
Summer Algae Science Institute  
ALGAL BASED EDUCATOR TRAINING

Bigelow Laboratory for Ocean Sciences

UNIVERSITY OF SOUTHERN MAINE

CULTIVATE  
Exporting Algae in Agriculture

K-12 STEM

SFCC  
SANTA FE COMMUNITY COLLEGE

NMFR  
NEW MEXICO FILM RESOURCE

PV A&M PRAIRIE VIEW A&M UNIVERSITY

BCSI  
BIOSCIENCE CORE SKILLS INSTITUTE

Cultivation curriculum & badging

AUSTIN COMMUNITY COLLEGE

UTEX  
Center for the University of Texas at Austin

LONE STAR COLLEGE

SOLANO COMMUNITY COLLEGE

Delgado COMMUNITY COLLEGE

FIU FLORIDA INTERNATIONAL UNIVERSITY

Biotech curriculum

AzCATI  
Arizona Center for Algae Technology and Innovation

NREL  
NATIONAL RENEWABLE ENERGY LABORATORY

QUALITAS HEALTH

POLARIS RENEWABLES

Field labs/ internships

Cal-CAB  
CALIFORNIA CENTER FOR ALGAE BIOTECHNOLOGY

UC San Diego

thealgae foundation

SCRIPPS INSTITUTION OF OCEANOGRAPHY

Online education

Cyanotech

DSM

EARTHRISE

GreenWave

MBIO  
MicroBio Engineering

QUALITAS HEALTH

Industrial Advisory Board

# Approach – DEI

## *BETO Diversity, Equity & Inclusion*

Diversity, equity, and inclusion (DEI)—these values are at the center of the current administration and U.S. Department of Energy (DOE) Bioenergy Technologies Office (BETO) programs. DEI is also key focus for ATEC, as we continue to build our network over the next three years. ATEC pursues new opportunities to add to our consortium members and affirms and empowers every student, industry partner, and educational organization. These efforts will ensure that ATEC's diverse perspectives provide solutions to further promote the values and goals of the Bioenergy Technologies Office.



### ATEC members and grant application partners include:

- Austin Community College (HSI)
- Delgado Community College (PBI)
- Florida A&M University (HBCU)
- Florida International University (HSI)
- Laney College (AANAPISI)
- Las Positas College (HSI)
- Lincoln University (HBCU)
- Lone Star College (HSI)
- Prairie View A&M University (HBCU)
- San Diego State University (AANAPISI & HSI)
- Santa Fe Community College (HSI)
- Shoreline Community College (AANAPISI)
- Solano Community College (AANAPISI & HSI)
- South Texas College (HSI)
- Temple University (HSI)
- University of Texas, Rio Grande Valley (HSI)
- Windward College (ANNH)

# Progress & Outcomes – Project Goals



**AlgaePrize 2022-2023 winners will be announced  
at the AlgaePrize Weekend April 2023**

**NREL, Golden, CO**

**\$15,000 Grand Champion (1)**

**\$10,000 Winners (4)**

**\$5,000 Student Team Finalists (15)**



# Progress & Outcomes – Project Goals



## Research Topics

### 1. Production

- Cultivar Enhancement
- Aquaculture Engineering
- Husbandry and Productivity

### 2. Downstream processing

- Harvesting and Processing
- Development of biorefinery applications

### 3. Novel products or tools

- New Product Development
- Modeling
- Environmental Services and Technical Applications

# Progress & Outcomes – Project Goals



U.S. Department of Energy  
Bioenergy Technologies Office

## Meet the AlgaePrize

### FINALIST TEAMS



ALGAEORITHM



PHYCOSIGHT



PURDUE CHEME



POND DOCTORS



AZCATI



THE CYANTIFIC  
METHOD



FITOENERGY  
TEAM



POLY-CULTURE  
JAM



TOXIC AMBROSIA  
SALAD



UNDERGROUND  
OCEAN FARMERS



THE CLEAN  
WATER  
CULTIVATORS



UC DAVIS  
GIANT KELP  
TEAM



PUPR  
ALGAEPRIZE  
TEAM



KELP!  
I NEED SOME  
ALGAE



KEEP CALM  
AND  
CHLAMY ON

LEARN MORE AT [ENERGY.GOV/ALGAEPRIZE](https://energy.gov/algaeprize) AND FOLLOW #ALGAEPRIZE ON SOCIAL

# Progress & Outcomes – Scheduled Efforts & Milestones

- Algal Biotech Badging
- Update ACES (Algae Cultivation Extension Short-courses)
- Establish formal MOU with one HBCU (historically black colleges and universities)
- Publish algal MOOC #3 Introduction to Seaweeds
- Create new algal course: Biology of Algae
- Conversion of ATEC curriculum and K-12 STEM to online courses/training
- Embed IGSOPs into course labs



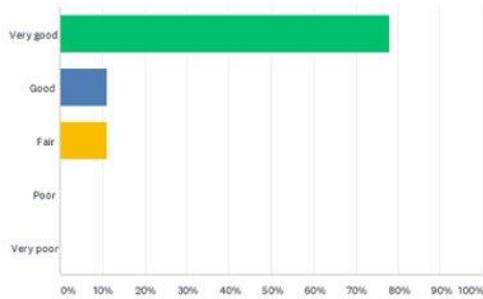
# Progress & Outcomes – Risk Mitigation

## Evaluation / Survey Results – complete college and K-12 assessment surveys

### Algae Cultivation Survey:

Algae Cultivation Course Student Survey

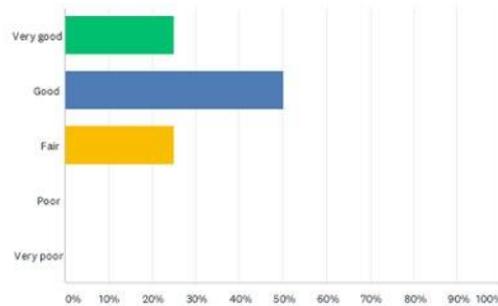
Overall, how would you rate the course?



### Biotech Survey:

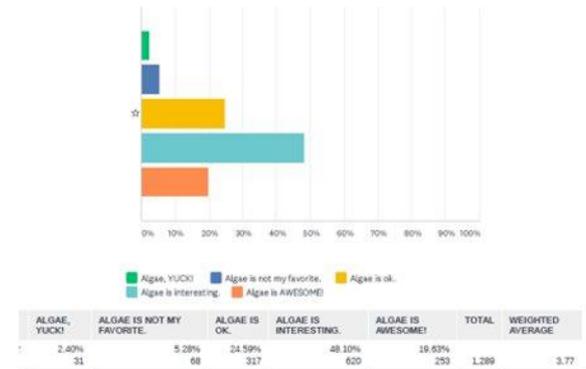
Algae Module Student Survey

Overall, how would you rate the algae module?



### Algae Academy Survey:

AFTER Algae Academy, how interested are you in algae?



# Progress & Outcomes – Project Goals/Risk Mitigation/Scheduled Efforts

## What's Next?

- Increase ATEC MOU Schools Recruitment
- Launch ACES Part 1 Seaweeds v 2.0
- Develop ACES Part 2 Microalgae v 2.0
- Increase participation in Algae Academy every academic year
- Complete MOOC #4 Harmful Algae Blooms
- Expand ATEC biotechnology & cultivation curriculum
- Continue development of PVAMU Algae Center of Excellence
- Launch AlgaePrize 2023-2025



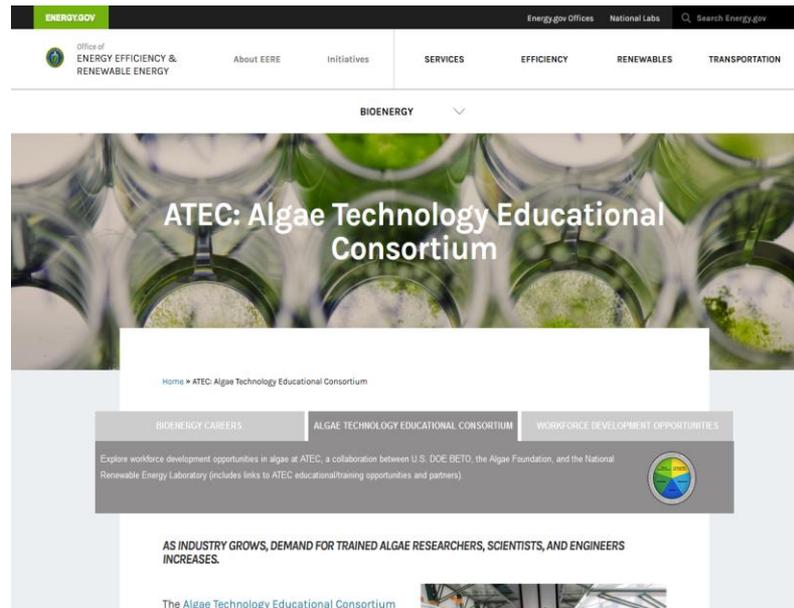
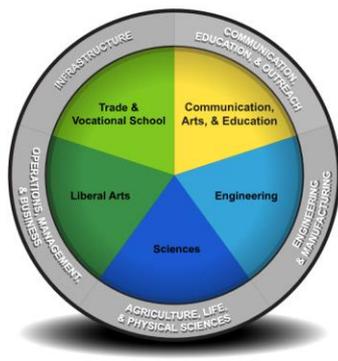
# Impact – Commercialization Potential

## Premier Program for BETO's Education and Workforce Development

- Promote ATEC program in BETO website and Career Exploration Wheel
- Disseminate ATEC progress
  - 3 publications and 65+ presentations
  - Social Media (9,166 friends, followers, members)



## Career Exploration Wheel



<https://www.energy.gov/eere/bioenergy/atec-algae-technology-educational-consortium>

# Impact – Commercialization Potential

## Algae Massive Open Online Courses (Algae MOOCs) on Coursera.org

### Introduction to Algae MOOC #1

- 24,000+ students (98% approval rating)
- 10% received a pay increase or promotion
- 43% received a tangible career benefit from this course

### Algae Biotechnology MOOC #2

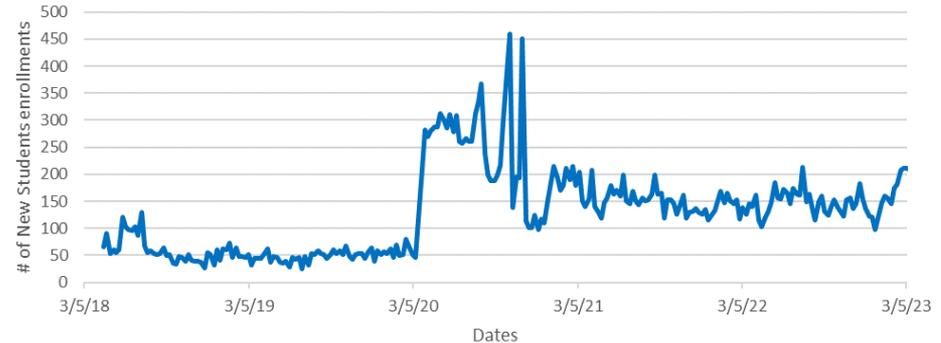
- 10,000+ students

### MOOC # 3 Introduction to Seaweeds (Published February 1, 2023)

- 300+ students

### MOOC # 4 Harmful Algal Blooms (developmental stage) with Dr. Schonna Manning, FIU (formerly of UTEX)

Algal MOOCs New Weekly Enrollments



# Impact – Commercialization Potential

## Asynchronous Online Aquaculture Extension Learning Opportunities Algae Cultivation Extension Short-Courses (ACES)

### Part 1. Seaweeds version 2.0

- Published Mar 2019
- 1,524 Registrations
- Primary source of students: U.S., India, Indonesia, Australia

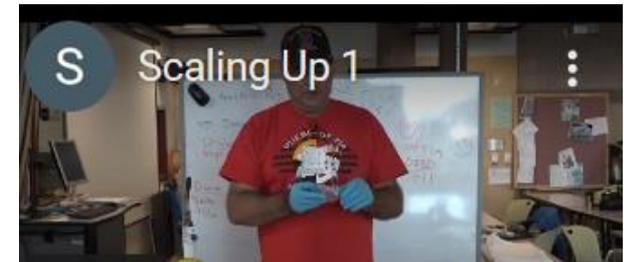


Total of 100 countries



### Part 2. Microalgae

- Published Aug 2019
- 931 Registrations
- Primary source of students: U.S., India, Vietnam, Canada, Indonesia, Mexico



# Impact – Commercialization Potential

## Community College Algae Cultivation Certificate Degree Program

- 310 participating students (cumulative - 6 years)
- Recruitment of graduates by algal farms
- Conversion from in-person courses to online format (5 classes)
- Development of heterotrophic cultivation curriculum (Fall 2021)
- Initiate Biology of Algae community college course (academic year 2022-2023)



# Impact – Commercialization Potential

## Algae Biotechnology Curriculum

### New Concepts & Pedagogy

- 1800 participating students (cumulative – 6 years, 15 schools)
- Completion of Biotech Lab Primer (Nov 2019)
- Completion of Intensive I and Intensive II lab courses (Sep 2020)
- Completion of Image Guided Standard Operating Procedures (July 2022)
- Alpha and Beta testing of biotech labs and IGSOPs
- Algal biotech IGSOPs workshop (August 2022)



*We have developed a dynamic suite of bench-approachable laboratory techniques and complementary image-guided standard operating procedures that can be easily adopted by academia and industry at all skill levels. We envision ATEC biotechnology training assets as integral tools for educators and students alike to help meet the demands of a rapidly growing algae-based workforce. And these modules have been integrated into dozens of classrooms across the nation. From biofuels to high-value natural products, ATEC provides the foundation to support the next generation of algal biotechnologists*

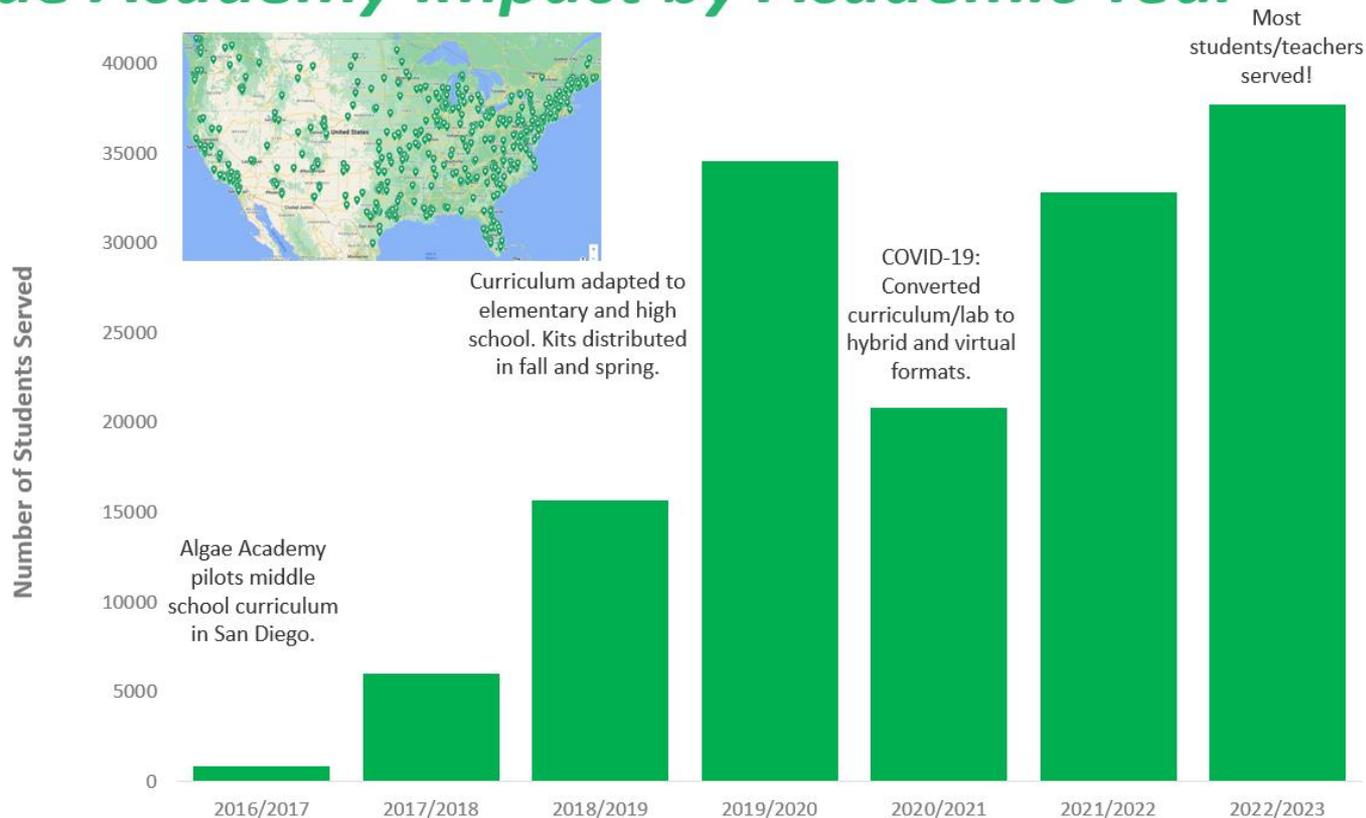
Dr. Schonna Manning, FIU, 2/2023

# Significant Impact & Outcomes

## Algae Academy Impact by Academic Year

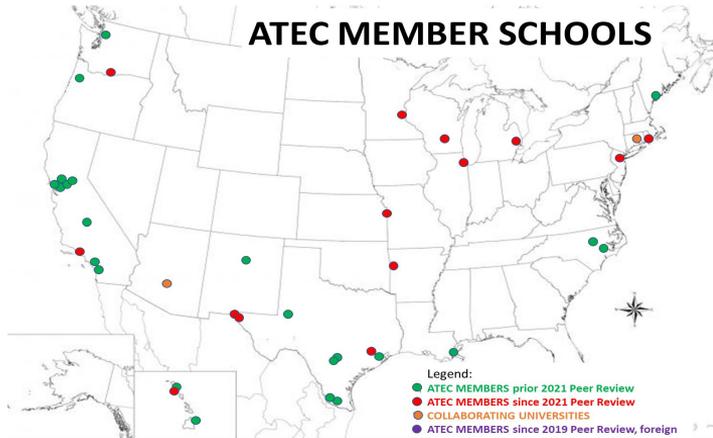


89% effective in teaching necessary STEM skills



# Significant Impact & Outcomes

## What's New in 22/23...



- Partnership with Bigelow National Lab to supply live algae
- Updated curriculum standards alignment documents to better serve teachers in the classroom
  - Next Generation Science Standards (NGSS)
  - Common Core State Standards, Mathematics, English, Language Arts
- Algae Academy reaches all 50 states!
- Algal MOOC #3 published
- Formal Collaboration with Future Farmers of America

# Summary – ATEC Prepares the Bioeconomy Workforce

Approach	Progress and Outcomes
<ul style="list-style-type: none"><li>• State-of-the-art curriculum development and innovative future algae topics</li><li>• Continued pivot to online (synchronous &amp; asynchronous) education</li><li>• Dissemination through BETO workforce development web platform and social media</li></ul>	<ul style="list-style-type: none"><li>• ACES Seaweeds and Microalgae</li><li>• Algae Academy</li><li>• Algae Center of Excellence (HBCU Partnership)</li><li>• AlgaePrize 2022-2023</li><li>• Cultivation and Biotechnology Curricula</li><li>• Digital Badge System</li><li>• IGSOPs</li><li>• MOOC #1, #2, #3</li></ul>

Impact (2016 – 2023)	DEI
<ul style="list-style-type: none"><li>• 179,000 students/participants</li><li>• 1,620 Algae Academy classrooms</li><li>• 50 States and 100 countries served</li><li>• 41 Partnering academic institutions</li><li>• 30 Nationally endorsed digital badges</li><li>• 15 Novel courses</li></ul>	<ul style="list-style-type: none"><li>• 10 HSI Schools</li><li>• 4 BSI/HBCU Schools</li><li>• 3 AANAPISI Schools</li><li>• 1 ANNH School</li></ul>



# Thank you!

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[www.nrel.gov](http://www.nrel.gov)

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Additional Slides

# Quad Chart Overview

## Timeline

- Project start date: 10/01/2015
- Project end date: 9/30/2025

	FY22-FY25	Total Award
<b>DOE Funding</b>	(10/01/2022 – 9/30/2025)	FY22-25 \$1.8M (ATEC), \$1.5M (AlgaePrize 2022-2023/2024-2025)

**TRL at Project Start:** 4

**TRL at Project End:** 6

**Project Partners:** Algae Foundation

**Funding Mechanism:** Lab Call

## Project Goal

Develop and implement new collaborative educational programs ranging from K-12 to universities and extension short courses.

## End of Project Milestone

Provide a flexible, sustainable, educational curriculum and training programs reaching 200,000 participants producing the next generation of algal cultivation, biotechnology and bioeconomy professionals, reduce workforce training costs and increasing algal production while generating momentum in advancing algal technologies in industry.

# Abbreviations and Acronyms

AANAPISI - Asian American and Native American Pacific Islander  
ABO – Algae Biomass Organization  
ACC – Austin Community College  
ACES – Algae Cultivation Extension Short-courses  
ANNH - Alaska Native-Serving and Native Hawaiian  
ATEC – Algae Technology Educational Consortium  
BETO – Bioenergy Technologies Office  
BSI – Black Serving Institution  
CC – Community College  
DOE – Department of Energy  
FY – Fiscal Year  
HBCU – Historically Black Colleges and Universities  
HSI – Hispanic Serving Institution  
MOOC – Massive Online Open Course  
NOAA – National Oceanographic Atmospheric Administration  
NREL – National Renewable Energy Laboratory  
SFCC – Santa Fe Community College  
STEM – Science, Technology, Engineering, and Mathematics  
UCSD – University of California, San Diego  
US – United States  
USDA – United States Department of Agriculture  
USM – University of Southern Maine  
UTEX – University of Texas, Austin

# Responses to Previous Reviewers' Comments

## COMMENTS

- Acknowledging in advance that this type of project undertaking is not within my experience or training, this reviewer cannot be anything less than completely impressed by the deep thinking, organized structure, and the passion for the mission and goals conveyed by the presentation. The continued expansion of the project's success and the scale at which additional students, schools, and now universities have been engaged is exceptional. The already-achieved nationwide scope and impact is equally impressive. We can be left confident that a workforce will be ready for the algae economy.
- ATEC is operating a large, team-driven, educational consortium to support education and workforce development goals for a future algal biofuels industry. The consortium has reached an impressive number of students ranging from kindergarten up through university. ATEC is commended on their rapid pivot to online content when the COVID pandemic shut down in-person learning. Looking ahead, this ability to offer curriculum both in person and online stands to reach a wider audience, helping to meet the program's goals.
- Overall, this project seems to be doing very well. The project management plan is clear and the implementation strategy seems to be going very well. The approach involving the Algae Academy and the massive open online courses seem to be reaching thousands of students. The impact is impressive, and the project continues to add ATEC members. Most of the members seem to be coastal; more focus should be directed to recruiting schools in the center of the United States. The project met all the FY 2020 milestones and seems to be on schedule.
- This is an amazing project that shows what the passion and dedication of a few people can achieve with the proper support. The organic growth of this grassroots initiative is remarkable and is expected to reach or exceed all project goals for number of students served by the various programs. The project has developed relevant and impactful programs for all grade levels. These curriculum and training programs will equip the next generation of algal cultivation, biotechnology, and bioeconomy professionals with the skills they need to succeed in an algae bioeconomy.
- This is an exciting and very worthwhile outreach project aiming to improve education and workforce development. The team and management plan described are appropriate for this project. The risks and mitigation strategies are clearly delineated for this project. Progress was described through tasks, milestones, and go/no-go decision points, providing an adequate assessment of progress for the project. The approach that the team is taking is exciting and is being implemented widely, through algae interest generators that provide curricula, standards, and outreach to K-12 along with more advanced education efforts, such as the massive open online courses. The impacts of this effort will be seen through the attraction of a new generation of scientists and well-informed public due to participation of K-12 institutions, partnerships with higher education institutions, and integrated efforts at the state and national level. The effort has met its FY 2020 milestones and has reached nearly 100,000 participants. The FY 2021 efforts are underway, having developed the training modules required for the first quarter. The team has developed an external certification and endorsement program for various technologies and methodologies and is well underway to expand its collaborative efforts with national organizations. This is an excellent project, well led, organized, and reaching a very diverse audience.

## PI RESPONSE TO REVIEWER COMMENTS

The ATEC team is very grateful to the BETO reviewers for their efforts and to BETO for continued support of algae education and bioeconomy workforce development. The ATEC curriculum and the Algae Academy have reached all 50 states and 45 countries. We continue to expand the ATEC partnering collegiate network through our collaborations with InnovateBIO and additional focused outreach. It is deeply gratifying to receive such a strong positive review. It sends us a clear message that we are on the right track and encourages us to continue to focus our energies on expanding the program to bring algae awareness to more students.

# Publications, Patents, Presentations, Awards, and Commercialization

## Publications:

Levine, I., C. Gerk., S. Gomez, J. Nalley, and M. Nalley. 2021. The Algae Foundation and Algae Technology Educational Consortium. *J. of the World Aquaculture Society*. 52(5): 1099-1117. <https://doi.org/10.1111/jwas.12817>

Cray, R. and I. Levine. 2022. Oxidative stress modulates astaxanthin synthesis in *Haematococcus pluvialis*. *J. Applied Phycology*. <https://doi.org/10.1007/s10811-022-02792-1>

## Presentations:

Levine, I. 2022. Algae Foundation's AlgaePrize, education and workforce development. Northeast Algae Society 2022. Burlington, VT. April 8-10, 2022

Levine, I. 2022. Algae Foundation's ATEC, AlgaePrize, and Algae Academy spearheading workforce development and education. Joint Aquatic Science Meeting 2022. Grand Rapids, MI # 1112. May 16, 2022

Traller Ojeda, J. And I. Levine. 2022. The Algae Foundation: Igniting the Algae Spark in the Public Education System. Joint Aquatic Science Meeting 2022. Grand Rapids, MI # 2314. May 16, 2022

Levine, I. and S. Kraan. 2023. Algae Foundation: spearheading workforce development, education, and training in support of the algal-based bioeconomy. International Seaweed Symposium. February 24, 2023. Hobart, Australia

# Overview – Project History

BETO Funded the Algae Foundation's Algae Technology Education Consortium (ATEC) 2015



Ten-year old 501(c)(3) non-profit organization dedicated to promote the power of algae to enhance human society and contribute to a sustainable environment through education, workforce development, mentoring, and public outreach.

## ATEC Progress since 2021 Peer Review

- 18 Partnering academic institutions
- 816 Algae Academy partnering grade school classrooms
- 10 Novel courses,
- 86,000 Students/participants
- 24 Nationally endorsed microcredential digital badges
- All 50 States served

## ATEC totals 2015-2023

- 41 Partnering academic institutions
- 1620 Algae Academy partnering grade school classrooms
- 15 Novel courses (lectures, labs, and intensives)
- 179,000 Students/participants
- 30 Nationally endorsed microcredential digital badges
- 50 States and 100 countries served



# ATEC MEMBER SCHOOLS

## ATEC MEMBERS

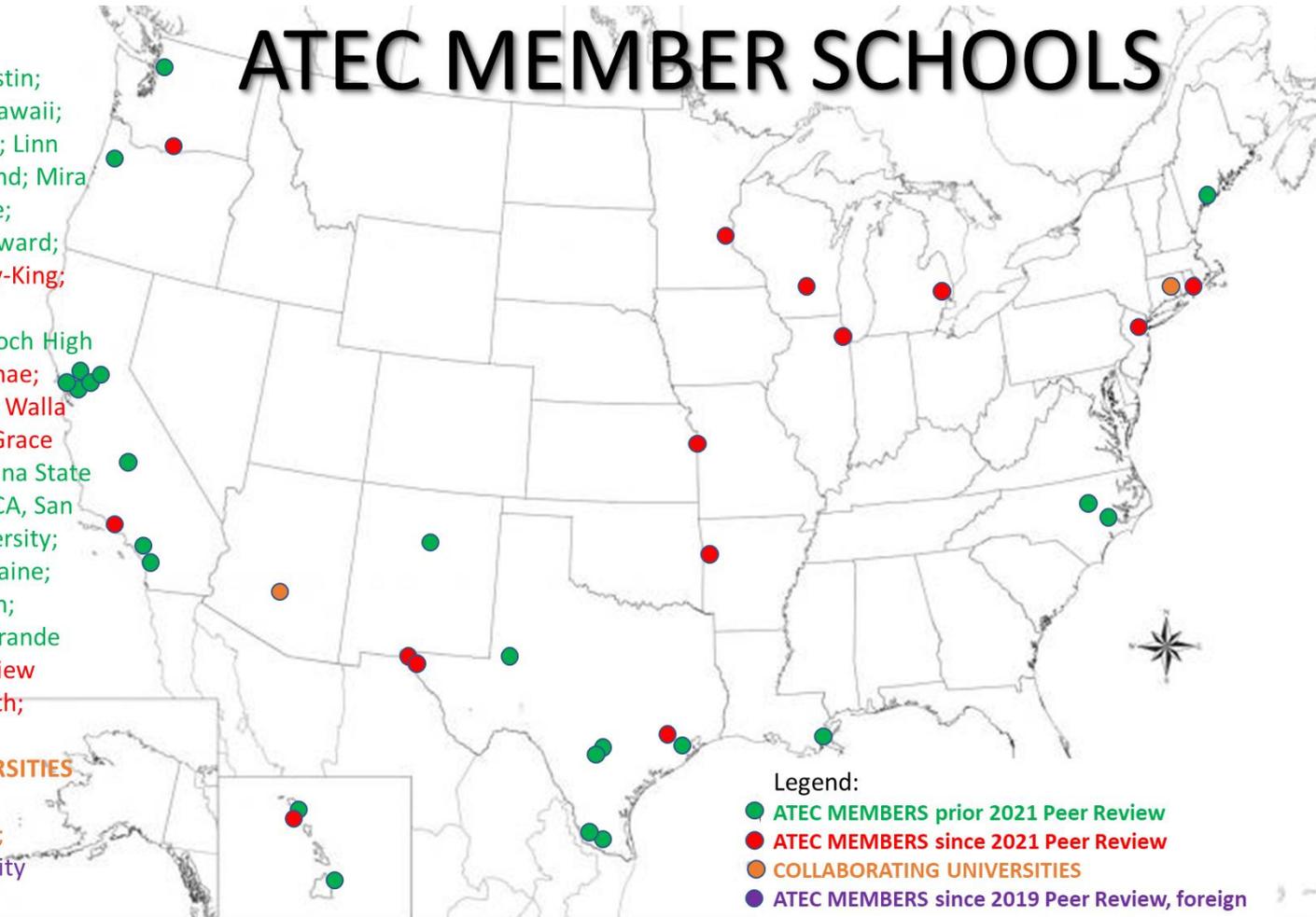
**Community Colleges:** Austin; Contra Costa; Delgado; Hawaii; Laney; Las Positas; Lenoir; Linn Benton; Lone Star; Midland; Mira Costa; Santa Fe; Shoreline; Solano; South Texas; Winward; Johnson County; Kennedy-King; Santa Monica

**High School:** James C. Enoch High School; Livingston; Wai'anae; Irvin; DeForest; Del Valle; Walla Walla; Mt. Hope; Totino Grace

**Universities:** North Carolina State University; University of CA, San Diego; Fresno State University; University of Southern Maine; University of Texas, Austin; University of Texas, Rio Grande Valley; Oakland; Prairie View A&M; Univ of AK, Ft. Smith;

## COLLABORATING UNIVERSITIES

Arizona State University; University of Connecticut; Incheon National University



### Legend:

- ATEC MEMBERS prior 2021 Peer Review
- ATEC MEMBERS since 2021 Peer Review
- COLLABORATING UNIVERSITIES
- ATEC MEMBERS since 2019 Peer Review, foreign

# Overview – Project History



Ten-year old 501(c)(3) non-profit organization dedicated to promote the power of algae to enhance human society and contribute to a sustainable environment through education, workforce development, mentoring, and public outreach.

BETO Funded the Algae Foundation's Algae Technology Educational Consortium (ATEC) 2015-2025

## Algal Massive Open Online Courses (Algal- MOOCs)

**Algal MOOC's Goal: Provide globally accessible algal-based curriculum to educate the future bioeconomy workforce**

- Available **FREE** on global content provider - **Coursera.org**
- Recruit leading phycologists as presenters
- Attract worldwide participants to new industry
- Initial development of next generation of algal-based bioeconomy professionals



MOOC # 1 Introduction to Algae **PUBLISHED**

MOOC # 2 Introduction to Algae Biotechnology **PUBLISHED**

MOOC # 3 Introduction to Seaweeds **PUBLISHED**

MOOC # 4 Harmful Algal Blooms (filming scheduled March 2023)

MOOC # 5 Novel Products (in development)

# Approach – Innovation

## ATEC Algae Cultivation Curricula (academic & extension platforms)

### ATEC Prepares People to Get Bioeconomy Jobs

- Provide cost-effective job training & workforce development
- Create a pathway to higher education
- Teach entrepreneurial skills
- Generate learning outcomes & skillsets determined by Industrial Advisory Board (IAB) consultation



**CERTIFICATE  
ALGAE  
CULTIVATION**

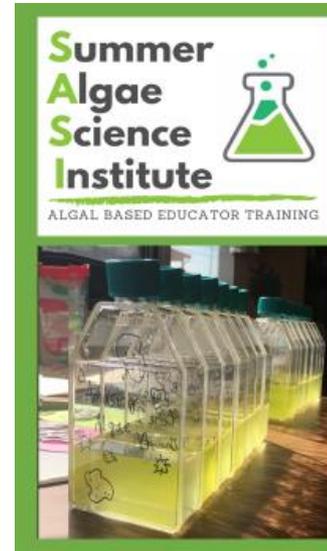
Algae production provides a sustainable source of biomass for bio-based products, feed, fuel and foods, creating high-quality jobs for an educated workforce. This Web-blended program provides that education and combines concepts with hands-on training. The Certificate in Algae Cultivation counts toward the Associate in Applied Science in Controlled Environment Agriculture.

**CAREER OPPORTUNITIES INCLUDE**  
Biological Technician, Engineer, Entrepreneur, Lab Technician, Plant Technician, Project Developer

# Approach – Innovation



- Assemble curricula team (educators, instructors, academics)
- Align with Next Generation Science Standards
- Promote “Algae as a Career”
- Recruit teachers (National Science Teachers Association (NSTA) & Future Farmers of America (FFA) presentations, referrals, and social media)



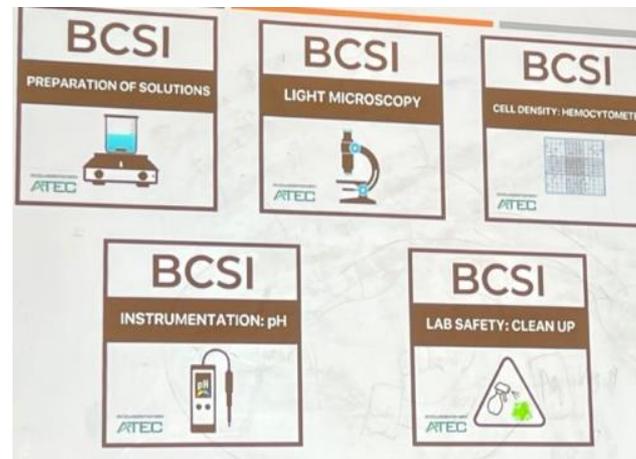
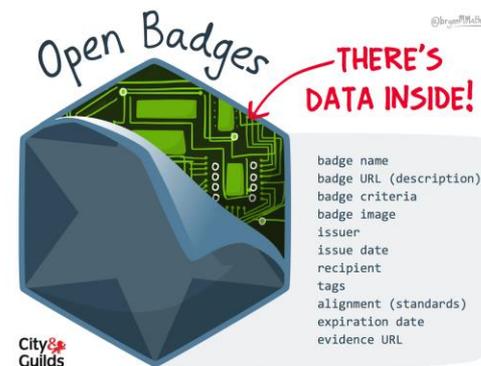
# Progress & Outcomes – Project Goals

Digital Badging is skill certifying system providing benefits to job applicants and employers



Algal Biotech Badging – develop six new Tier 1 biotech badges

- Concentration and Dilution Calculations
- Small Volume Metrology
- Aseptic Technique (Lab / Bench Scale)
- Labeling, Documentation, and SOP
- Safety Hazard Assessment (Ability to identify hazards in an SOP, MSDS, and lab scenarios)
- Microscopy



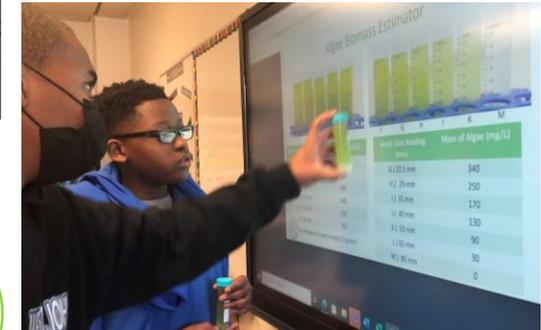
# Significant Impact & Outcomes

## What Teachers are Saying...

My students are so engaged, involved, and loving this program. I had a drop-in observation today and my principal was impressed with what we were doing today (microscopes and dichotomous key)!

It's sometimes hard to get high school juniors/seniors excited about science (especially at 8:00 in the morning!) but they are engaged in this project.

This is a great curriculum that is easy to implement and follow, with great learning results.



89.37% effective  
in teaching  
necessary STEM  
skills

# Significant Impact & Outcomes

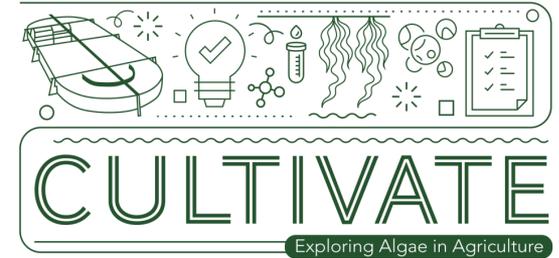
## *ATEC Funding Partnerships*



5-day, hands-on STEM  
curriculum and lab  
Est. 2016



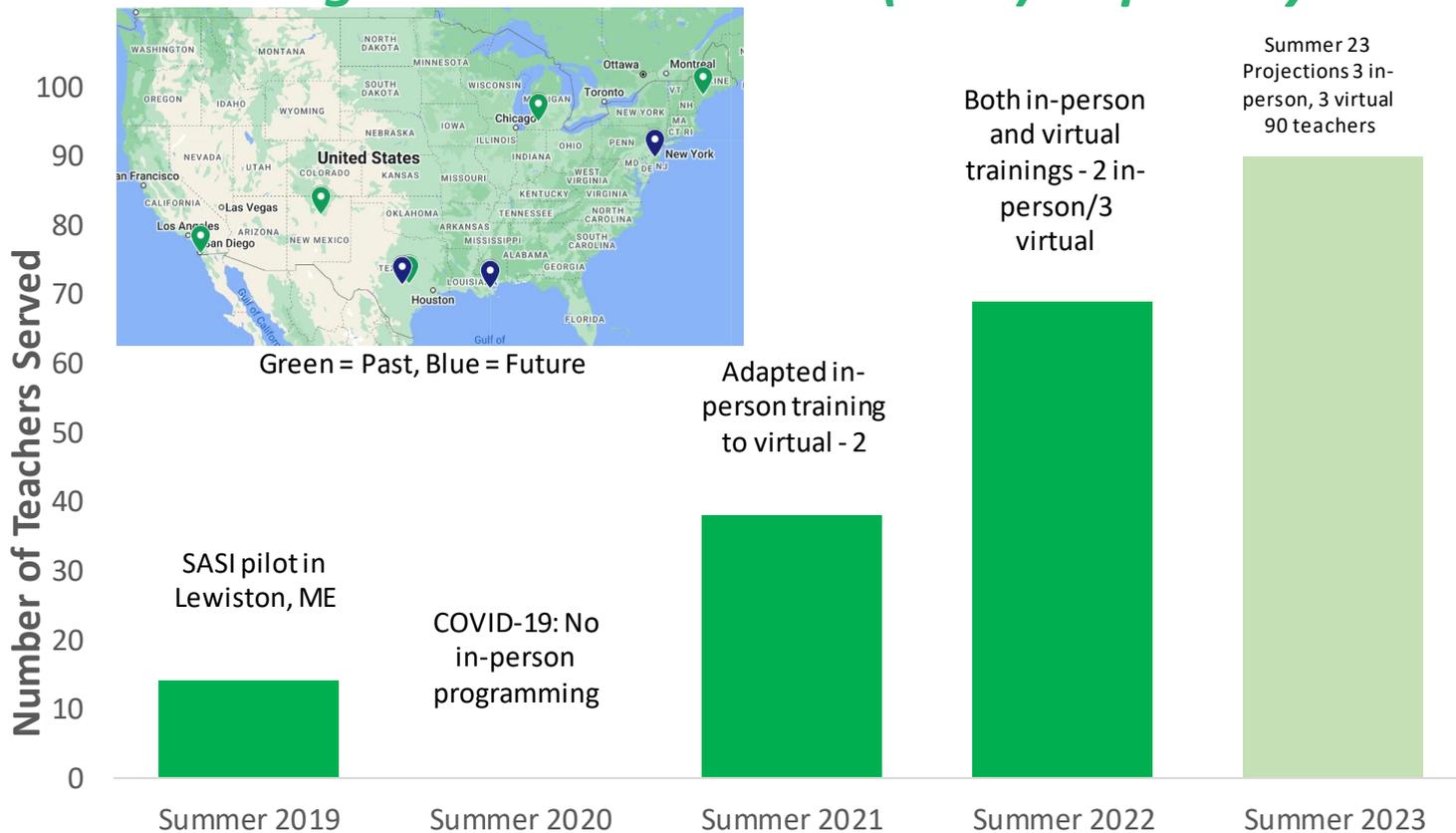
Educator professional  
development training to  
learn the Algae Academy  
curriculum  
Est. 2019  
Funded by USDA NIFA



Ag-centered STEM curriculum  
for high schoolers.  
Est. 2022  
Funded by USDA NIFA

# Significant Impact & Outcomes

## Summer Algae Science Institute (SASI) Impact by Year



# Significant Impact & Outcomes

## *Cultivate Impact – Pilot year*

- The Algae Foundation worked in collaboration with the National FFA Organization
- 100% retention of year 1 educators
- Cultivate awarded five, \$1,000 grants to high-school students pursuing algae-centered agricultural research projects



 <b>Algae 101</b> Get to know what algae are.	 <b>Algae as a Crop</b> Discover how algae are farmed.	 <b>Algae Uses</b> Investigate the many uses of this emerging crop.
 <b>Algae Jobs</b> Meet some people that make it happen.	 <b>Algae Growth</b> Start your own algae crop, watch it grow.	 <b>Algae Innovation</b> Design and pitch your own algae company!

## ATEC MEMBER SCHOOLS

